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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/676,921 | 10/01/2003 | David E. Lowell | 200208635-1 | 8290 |

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| EXAMINER |
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ZHE, MENG YAO

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| ART UNIT | PAPER NUMBER |
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2109

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| MAIL DATE | DELIVERY MODE |
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06/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/676,921

Applicant(s)

LOWELL ET AL.

Examiner

MengYao Zhe

Art Unit

2109

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 to 45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 to 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/01/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This is the initial Office Action based on the 10/676921 application filed on 10/1/2003.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 29 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 29 lacks the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. Although physical articles such as the processor and memory is mentioned in the preamble of the claim, the actual body of the claim lacks necessary physical articles. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. While the preamble appears to claim for a physical system, the actual body of the claim lacks necessary physical articles. There is nothing in the body of the claim to make the entire claim a physical system.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 to 45 are rejected under 35 U.S.C 102(b) as being anticipated by Bean et al, Patent No. 4,843,541 (hereafter Bean).

Art Unit: 2109

As per claims 1, 20, 29, 30, 38, Bean teaches In a computer including hardware, a virtual machine monitor, and first and second operating system instances, a method comprising:

using the virtual machine monitor to expose the first operating system instance to a first hardware partition and prevent the first operating system instance from discovering a second hardware partition; (*Column 7, lines 55 to Column 8, lines 20: Each guest with its own OS has its own set of private partitions to use. The host corresponds to the VMM.*)

using the virtual machine monitor to expose the second operating system instance to the second hardware partition and prevent the second operating system instance from discovering the first hardware partition; (*Column 7, lines 55 to Column 8, lines 20*)

using the virtual machine monitor to share at least some of the hardware among the first and second operating system instances. (*Column 8, lines 12 to 15*)

As per claim 2, Bean teaches the method of claim 1, wherein the first and second partitions include different portions of memory. (*Column 7, lines 55 to Column 8, lines 20*)

Art Unit: 2109

As per claim 3, Bean teaches the method of claim 1, wherein the first and second partitions include different I/O devices. (Column 7, lines 55 to Column 8, lines 20, Column 8, lines 40 to 45)

As per claim 4, Bean teaches the method of claim 1, wherein the shared hardware includes a CPU. (Column 8, lines 59 to 65)

As per claim 5, Bean teaches the method of claim 1, wherein the virtual machine monitor allows the first instance to have direct control over the first partition, and the second instance to have direct control over the second partition. (Column 8, lines 15 to 25)

As per claim 6, 21, 31, 39, Bean teaches the method of claim 1, wherein the virtual machine monitor configures the hardware so accesses to addresses of interest trap to the VMM; and wherein the first and second instances are booted on the virtual machine monitor after the hardware has been configured. (Column 12, lines 1 to 45, Column 17, lines 15 to 25: The Host intercept all access to the I/O by making all interrupts going to its IPR and then distributing the interrupts to corresponding guests; Column 7, lines 55 to Column 8, lines 20: It is inherent that the guest and its associated resource could not exist without having been configured first.)

As per claim 7, Bean teaches the method of claim 6, wherein the virtual machine monitor uses memory management to partition I/O devices. (Column 7, lines 55 to Column 8, lines 20)

Art Unit: 2109

As per claim 8, Bean teaches the method of claim 7, wherein the VMM configures the hardware to trap to the VMM either when an access misses in a translation lookaside buffer, or when one of the operating system instances modifies its page table. (Column 28, lines 30 to 50, Column 30, lines 15 to 25: All hardware access from any guest must go through the host or VMM, so even in the case of an access miss or modification of page table, access is trapped.)

As per claim 9, Bean teaches the method of claim 7, wherein the hardware is configured to treat physical addresses as virtual addresses, whereby the virtual machine monitor also uses memory management to trap accesses to physical addresses. (Column 28, lines 30 to 50)

As per claim 10, 22, 32, 40, Bean teaches the method of claim 9, wherein the hardware includes a CPU, and wherein the virtual machine monitor configures the CPU to disable direct accessibility of the physical memory, whereby the VMM can trap I/O and physical memory accesses. (Column 8, lines 59 to 68, Column 17, lines 15 to 25, lines 35 to 42, lines 45 to 53, Column 28, lines 30 to 50: The host has total control over the CPU.)

As per claim 11, 23, 33, 41, Bean teaches the method of claim 7, wherein using the memory management includes inspecting an address translation on a trap and modifying, accepting, or rejecting the translation. (Column 28, lines 30 to 50, Column 30, lines 15 to 25: The host does translations, which include modification and or accepting.)

Art Unit: 2109

As per claim 12, 24, 34, 42, Bean teaches the method of claim 7, wherein using the memory management includes inserting translations for I/O addresses into a translation lookaside buffer or page table. (Column 29, lines 4 to 25, Column 30, lines 15 to 40)

As per claim 13, 25, Bean teaches the method of claim 12, wherein the virtual machine monitor grants unfettered access by an operating system instance to the range of physical memory covered by the translation entry in its translation lookaside buffer or page table. (Column 8, lines 1 to 20, Column 30, lines 15 to 40: The guest with its operating system may access all of its assigned memory partitions using the TLB or page table, as long as it has rights to it.)

As per claim 14, 26, 35, 43, Bean teaches the method of claim 6, wherein the traps occur during resource discovery of a booting operating system instance; and wherein the virtual machine monitor responds to a trap by misinforming the booting OS instance about the existence of hardware not in its partition. (Column 8, lines 1 to 25: The host has the only power to distribute partitions of hardware to guests. Those that are not assigned to a guest, that guest will not be able to "see" it.)

As per claim 15, 27, 36, 44, Bean teaches the method of claim 1, wherein the virtual machine monitor modifies a hardware description table to expose and prevent discovery. (Column 7, lines 55 to Column 8, lines 25, Column 28, lines 30 to 55, Column 30, lines 1 to 42: The host performs all translations and keeps track of what

Art Unit: 2109

partition is assigned to what guest. Therefore, it has all the power to prevent one guest from accessing partitions that are not assigned to it.)

As per claim 16, Bean teaches the method of claim 1, wherein the virtual machine monitor performs emulation to share hardware. (Column 8, lines 15 to 17)

As per claim 17, Bean teaches the method of claim 1, further comprising: delivering interrupts to interrupt handlers maintained by the first instance when the first instance accesses the first partition; and delivering interrupts directly to interrupt handlers maintained by the second instance when the second instance accesses the second partition. (Column 12 lines 4 to 45)

As per claim 18, Bean teaches the method of claim 1, wherein operation of the virtual machine monitor is transparent to the first and second operating system instances. (Column 1, lines 25 to 60, Column 7, lines 55 to Column 8 line 25)

As per claim 19, 28, 37, 45, Bean teaches the method of claim 1, wherein the virtual machine monitor partitions I/O devices bus-wise. (Column 7, lines 55 to 65, Column 8, lines 34 to 45: Subchannels corresponds to partitioned bus.)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MengYao Zhe whose telephone number is 571-272-

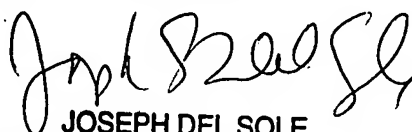
Art Unit: 2109

6946. The examiner can normally be reached on Monday Through Friday, 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on 571-272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M.Z.


JOSEPH DEL SOLE
SUPERVISORY PATENT EXAMINER
6/7/07